



# New Jersey Department of Health and Senior Services

## HAZARDOUS SUBSTANCE FACT SHEET

Common Name: **BIS (2-CHLOROMETHYL)  
ETHER**

CAS Number: 542-88-1  
DOT Number: UN 2249

RTK Substance number: 0234  
Date: August 1992 Revision: July 1998

### HAZARD SUMMARY

- \* **Bis (2-Chloromethyl) Ether** can affect you when breathed in and may be absorbed through the skin.
- \* **Bis (2-Chloromethyl) Ether** is a CARCINOGEN--HANDLE WITH EXTREME CAUTION.
- \* **Bis (2-Chloromethyl) Ether** can irritate or burn the skin and eyes.
- \* Breathing **Bis (2-Chloromethyl) Ether** can irritate the lungs causing coughing and/or shortness of breath. Higher exposures can cause a build-up of fluid in the lungs (pulmonary edema), a medical emergency, with severe shortness of breath.
- \* Exposure to **Bis (2-Chloromethyl) Ether** can cause loss of appetite, nausea, fatigue and weakness.
- \* **Bis (2-Chloromethyl) Ether** is a FLAMMABLE LIQUID and a FIRE HAZARD.

### IDENTIFICATION

**Bis (2-Chloromethyl) Ether** is a colorless liquid. It is used as a chemical intermediate in the manufacture of plastics and ion-exchange resins.

### REASON FOR CITATION

- \* **Bis (2-Chloromethyl) Ether** is on the Hazardous Substance List because it is regulated by OSHA and cited by NIOSH, NTP, ACGIH, IARC, DOT, HHAG, EPA, and DEP.
- \* This chemical is on the Special Health Hazard Substance List because it is a CARCINOGEN and is FLAMMABLE.
- \* Definitions are provided on page 5.

### HOW TO DETERMINE IF YOU ARE BEING EXPOSED

The New Jersey Right to Know Act requires most employers to label chemicals in the workplace and requires public employers to provide their employees with information and training concerning chemical hazards and controls. The federal OSHA Hazard Communication Standard, 1910.1200, requires private employers to provide similar training and information to their employees.

- \* If you think you are experiencing any work-related health problems, see a doctor trained to recognize occupational diseases. Take this Fact Sheet with you.

### WORKPLACE EXPOSURE LIMITS

OSHA: No exposure limits have been established by OSHA for **Bis (2-Chloromethyl) Ether**. Please refer to the full OSHA Standard 1910.1008.

NIOSH: Recommends that exposure to occupational carcinogens be limited to the lowest feasible concentration.

ACGIH: The recommended airborne exposure limit is **0.001 ppm** averaged over an 8-hour workshift.

- \* **Bis (2-Chloromethyl) Ether** is a CARCINOGEN in humans. There may be no safe level of exposure to a carcinogen, so all contact should be reduced to the lowest possible level.
- \* The above exposure limit is for air levels only. When skin contact also occurs, you may be overexposed, even though air levels are less than the limit listed above.

### WAYS OF REDUCING EXPOSURE

- \* Enclose operations and use local exhaust ventilation at the site of chemical release. If local exhaust ventilation or enclosure is not used, respirators should be worn.
- \* A regulated, marked area should be established where **Bis (2-Chloromethyl) Ether** is handled, used, or stored as required by the OSHA Standard 1910.1008.
- \* Wear protective work clothing.
- \* Wash thoroughly immediately after exposure to **Bis (2 Chloromethyl) Ether** and at the end of the workshift.
- \* Post hazard and warning information in the work area. In addition, as part of an ongoing education and training effort, communicate all information on the health and safety hazards of **Bis (2-Chloromethyl) Ether** to potentially exposed workers.

This Fact Sheet is a summary source of information of all potential and most severe health hazards that may result from exposure. Duration of exposure, concentration of the substance and other factors will affect your susceptibility to any of the potential effects described below.

-----

## HEALTH HAZARD INFORMATION

### Acute Health Effects

The following acute (short-term) health effects may occur immediately or shortly after exposure to **Bis (2-Chloromethyl) Ether**:

- \* **Bis (2-Chloromethyl) Ether** can irritate or burn the skin and eyes.
- \* Breathing **Bis (2-Chloromethyl) Ether** can irritate the lungs causing coughing and/or shortness of breath. Higher exposures can cause a build-up of fluid in the lungs (pulmonary edema), a medical emergency, with severe shortness of breath.
- \* Exposure to **Bis (2-Chloromethyl) Ether** can cause loss of appetite, nausea and fatigue. Higher exposure can cause irritability, anxiety and weakness.

### Chronic Health Effects

The following chronic (long-term) health effects can occur at some time after exposure to **Bis (2-Chloromethyl) Ether** and can last for months or years:

### Cancer Hazard

- \* **Bis (2-Chloromethyl) Ether** is a CARCINOGEN. It has been shown to cause lung cancer in humans and cancer in experimental animals.
- \* Many scientists believe there is no safe level of exposure to a carcinogen. Such substances may also have the potential for causing reproductive damage in humans.

### Reproductive Hazard

- \* According to the information presently available to the New Jersey Department of Health and Senior Services, **Bis (2-Chloromethyl) Ether** has not been tested for its ability to affect reproduction.

### Other Long-Term Effects

- \* **Bis (2-Chloromethyl) Ether** has not been tested for other chronic (long-term) health effects.

## MEDICAL

### Medical Testing

Before beginning employment and at regular times after that, the following is recommended:

- \* Consider chest x-ray after acute overexposure.

- \* OSHA requires preassignment physical: personal history, family and occupational background, inclusive of genetic and environmental factors - at least annually.

Any evaluation should include a careful history of past and present symptoms with an exam. Medical tests that look for damage already done are not a substitute for controlling exposure.

Request copies of your medical testing. You have a legal right to this information under OSHA 1910.20.

## WORKPLACE CONTROLS AND PRACTICES

Unless a less toxic chemical can be substituted for a hazardous substance, **ENGINEERING CONTROLS** are the most effective way of reducing exposure. The best protection is to enclose operations and/or provide local exhaust ventilation at the site of chemical release. Isolating operations can also reduce exposure. Using respirators or protective equipment is less effective than the controls mentioned above, but is sometimes necessary.

In evaluating the controls present in your workplace, consider: (1) how hazardous the substance is, (2) how much of the substance is released into the workplace and (3) whether harmful skin or eye contact could occur. Special controls should be in place for highly toxic chemicals or when significant skin, eye, or breathing exposures are possible.

In addition, the following controls are recommended:

- \* Automatically pump liquid **Bis (2 Chloromethyl) Ether** from drums or other storage containers to process containers.
- \* Specific engineering controls are required for this chemical by OSHA. Refer to the OSHA Standard: 29 CFR 1910.1008.
- \* A glove box or a Class I, Type B, biological safety hood should be used when mixing, handling, or preparing **Bis (2-Chloromethyl) Ether**.
- \* Before entering a confined space where **Bis (2-Chloromethyl) Ether** may be present, check to make sure that an explosive concentration does not exist.

Good **WORK PRACTICES** can help to reduce hazardous exposures. The following work practices are recommended:

- \* Workers whose clothing has been contaminated by **Bis (2-Chloromethyl) Ether** should change into clean clothing promptly.
- \* Do not take contaminated work clothes home. Family members could be exposed.
- \* Contaminated work clothes should be laundered by individuals who have been informed of the hazards of exposure to **Bis (2-Chloromethyl) Ether**.

- \* Eye wash fountains should be provided in the immediate work area for emergency use.
- \* If there is the possibility of skin exposure, emergency shower facilities should be provided.
- \* On skin contact with **Bis (2-Chloromethyl) Ether**, immediately wash or shower to remove the chemical. At the end of the workshift, wash any areas of the body that may have contacted **Bis (2-Chloromethyl) Ether**, whether or not known skin contact has occurred.
- \* Do not eat, smoke, or drink where **Bis (2-Chloromethyl) Ether** is handled, processed, or stored, since the chemical can be swallowed. Wash hands carefully before eating or smoking.

## PERSONAL PROTECTIVE EQUIPMENT

WORKPLACE CONTROLS ARE BETTER THAN PERSONAL PROTECTIVE EQUIPMENT. However, for some jobs (such as outside work, confined space entry, jobs done only once in a while, or jobs done while workplace controls are being installed), personal protective equipment may be appropriate.

OSHA 1910.132 requires employers to determine the appropriate personal protective equipment for each hazard and to train employees on how and when to use protective equipment.

The following recommendations are only guidelines and may not apply to every situation.

### Clothing

- \* Avoid skin contact with **Bis (2-Chloromethyl) Ether**. Wear protective gloves and clothing. Safety equipment suppliers/manufacturers can provide recommendations on the most protective glove/clothing material for your operation.
- \* All protective clothing (suits, gloves, footwear, headgear) should be clean, available each day, and put on before work.

### Eye Protection

- \* Eye protection is required and is included in the recommended respiratory protection.
- \* Contact lenses should not be worn when working with this substance.

### Respiratory Protection

#### IMPROPER USE OF RESPIRATORS IS DANGEROUS.

Such equipment should only be used if the employer has a written program that takes into account workplace conditions, requirements for worker training, respirator fit testing and medical exams, as described in OSHA 1910.134.

- \* Where the potential exists for exposure over **0.001 ppm**, use a MSHA/NIOSH approved supplied-air respirator with a full facepiece operated in a pressure-demand or other positive-pressure mode. For increased protection use in combination with an auxiliary self-contained breathing apparatus operated in a pressure-demand or other positive-pressure mode.

## HANDLING AND STORAGE

- \* Prior to working with **Bis (2-Chloromethyl) Ether** you should be trained on its proper handling and storage.
- \* A regulated, marked area should be established where **Bis (2-Chloromethyl) Ether** is handled, used, or stored.
- \* **Bis (2-Chloromethyl) Ether** is not compatible with STRONG ACIDS (such as HYDROCHLORIC, SULFURIC and NITRIC).
- \* Store in tightly closed containers in a cool, well-ventilated area away from WATER and MOIST AIR.
- \* Sources of ignition, such as smoking and open flames, are prohibited where **Bis (2-Chloromethyl) Ether** is handled, used, or stored.
- \* Metal containers involving the transfer of **Bis (2-Chloromethyl) Ether** should be grounded and bonded. Drums must be equipped with self-closing valves, pressure vacuum bungs, and flame arresters.
- \* Use only non-sparking tools and equipment, especially when opening and closing containers of **Bis (2-Chloromethyl) Ether**.
- \* Wherever **Bis (2-Chloromethyl) Ether** is used, handled, manufactured, or stored, use explosion-proof electrical equipment and fittings.

## QUESTIONS AND ANSWERS

- Q: If I have acute health effects, will I later get chronic health effects?
- A: Not always. Most chronic (long-term) effects result from repeated exposures to a chemical.
- Q: Can I get long-term effects without ever having short-term effects?
- A: Yes, because long-term effects can occur from repeated exposures to a chemical at levels not high enough to make you immediately sick.
- Q: What are my chances of getting sick when I have been exposed to chemicals?
- A: The likelihood of becoming sick from chemicals is increased as the amount of exposure increases. This is determined by the length of time and the amount of material to which someone is exposed.

- Q: When are higher exposures more likely?
- A: Conditions which increase risk of exposure include physical and mechanical processes (heating, pouring, spraying, spills and evaporation from large surface areas such as open containers), and "confined space" exposures (working inside vats, reactors, boilers, small rooms, etc.).
- Q: Is the risk of getting sick higher for workers than for community residents?
- A: Yes. Exposures in the community, except possibly in cases of fires or spills, are usually much lower than those found in the workplace. However, people in the community may be exposed to contaminated water as well as to chemicals in the air over long periods. Because of this, and because of exposure of children or people who are already ill, community exposures may cause health problems.
- Q: Don't all chemicals cause cancer?
- A: No. Most chemicals tested by scientists are not cancer-causing.
- Q: Should I be concerned if a chemical causes cancer in animals?
- A: Yes. Most scientists agree that a chemical that causes cancer in animals should be treated as a suspected human carcinogen unless proven otherwise.
- Q: But don't they test animals using much higher levels of a chemical than people usually are exposed to?
- A: Yes. That's so effects can be seen more clearly using fewer animals. But high doses alone don't cause cancer unless it's a cancer agent. In fact, a chemical that causes cancer in animals at high doses could cause cancer in humans exposed to low doses.

-----  
The following information is available from:

New Jersey Department of Health and Senior Services  
Occupational Disease and Injury Services  
PO Box 360  
Trenton, NJ 08625-0360  
(609) 984-1863  
(609) 292-5677 (fax)

Web address: <http://www.state.nj.us/health/eoh/odisweb/>

#### Industrial Hygiene Information

Industrial hygienists are available to answer your questions regarding the control of chemical exposures using exhaust ventilation, special work practices, good housekeeping, good hygiene practices, and personal protective equipment including respirators. In addition, they can help to interpret the results of industrial hygiene survey data.

#### Medical Evaluation

If you think you are becoming sick because of exposure to chemicals at your workplace, you may call personnel at the Department of Health and Senior Services, Occupational Disease and Injury Services, who can help you find the information you need.

#### Public Presentations

Presentations and educational programs on occupational health or the Right to Know Act can be organized for labor unions, trade associations and other groups.

#### Right to Know Information Resources

The Right to Know Infoline (609) 984-2202 can answer questions about the identity and potential health effects of chemicals, list of educational materials in occupational health, references used to prepare the Fact Sheets, preparation of the Right to Know survey, education and training programs, labeling requirements, and general information regarding the Right to Know Act. Violations of the law should be reported to (609) 984-2202.

-----

## DEFINITIONS

**ACGIH** is the American Conference of Governmental Industrial Hygienists. It recommends upper limits (called TLVs) for exposure to workplace chemicals.

A **carcinogen** is a substance that causes cancer.

The **CAS number** is assigned by the Chemical Abstracts Service to identify a specific chemical.

A **combustible** substance is a solid, liquid or gas that will burn.

A **corrosive** substance is a gas, liquid or solid that causes irreversible damage to human tissue or containers.

**DEP** is the New Jersey Department of Environmental Protection.

**DOT** is the Department of Transportation, the federal agency that regulates the transportation of chemicals.

**EPA** is the Environmental Protection Agency, the federal agency responsible for regulating environmental hazards.

A **fetus** is an unborn human or animal.

A **flammable** substance is a solid, liquid, vapor or gas that will ignite easily and burn rapidly.

The **flash point** is the temperature at which a liquid or solid gives off vapor that can form a flammable mixture with air.

**HHAG** is the Human Health Assessment Group of the federal EPA.

**IARC** is the International Agency for Research on Cancer, a scientific group that classifies chemicals according to their cancer-causing potential.

A **miscible** substance is a liquid or gas that will evenly dissolve in another.

**mg/m<sup>3</sup>** means milligrams of a chemical in a cubic meter of air. It is a measure of concentration (weight/volume).

**MSHA** is the Mine Safety and Health Administration, the federal agency that regulates mining. It also evaluates and approves respirators.

A **mutagen** is a substance that causes mutations. A **mutation** is a change in the genetic material in a body cell. Mutations can lead to birth defects, miscarriages, or cancer.

**NAERG** is the North American Emergency Response Guidebook. It was jointly developed by Transport Canada, the United States Department of Transportation and the Secretariat of Communications and Transportation of Mexico. It is a guide for first responders to quickly identify the specific or generic hazards of material involved in a transportation incident, and to protect themselves and the general public during the initial response phase of the incident.

**NCI** is the National Cancer Institute, a federal agency that determines the cancer-causing potential of chemicals.

**NFPA** is the National Fire Protection Association. It classifies substances according to their fire and explosion hazard.

**NIOSH** is the National Institute for Occupational Safety and Health. It tests equipment, evaluates and approves respirators, conducts studies of workplace hazards, and proposes standards to OSHA.

**NTP** is the National Toxicology Program which tests chemicals and reviews evidence for cancer.

**OSHA** is the Occupational Safety and Health Administration, which adopts and enforces health and safety standards.

**PEOSHA** is the Public Employees Occupational Safety and Health Act, a state law which sets PELs for New Jersey public employees.

**ppm** means parts of a substance per million parts of air. It is a measure of concentration by volume in air.

A **reactive** substance is a solid, liquid or gas that releases energy under certain conditions.

A **teratogen** is a substance that causes birth defects by damaging the fetus.

**TLV** is the Threshold Limit Value, the workplace exposure limit recommended by ACGIH.

The **vapor pressure** is a measure of how readily a liquid or a solid mixes with air at its surface. A higher vapor pressure indicates a higher concentration of the substance in air and therefore increases the likelihood of breathing it in.

